

REMARKS

The claims remaining in this patent application following amendment continue to be Claims 1, 3, 19 and 21-24. No claims have been added or cancelled. Claims 1 and 19 are amended.

Claims 1, 3, 19 and 21 are rejected under 35 U.S.C. 103 as being unpatentable over the patent to Pieroni et al (5,922,944) in view of the patent to Gouge (5,859,363) and Brayman et al (4,754,638). This rejection is respectfully traversed. Independent Claim 1 has been amended to recite an apparatus for generating smoke for use at a volatile, potentially explosive environment (e.g. the evaporative system of a motor vehicle) by means of a closed smoke producing chamber within which a flammable fluid (e.g. oil) is supplied so as to be vaporized into smoke when heated. In accordance with the present improvement, a supply of non-combustible nitrogen gas is delivered to the closed smoke producing chamber under pressure so as to blow a portion of the flammable fluid against a heating element that is located within the smoke producing chamber to create smoke. However, by employing non-combustible nitrogen gas to blow the flammable fluid against the heating element, dieseling within the closed, smoke producing chamber is prevented and the possibility of an explosion at the volatile, potentially explosive environment in which the smoke will be used is advantageously avoided.

As disclosed in the aforementioned patent to Pieroni et al, compressed air (which contains combustible oxygen) has been used to blow a flammable fluid against a heating element, because it was believed that a combustible gas was required to promote the ignition process for

vaporizing the fluid into smoke. That is to say, one would expect the compressed air to burn so as to create a combustible environment in which to make smoke. In this same regard, where compressed air is used in a volatile, potentially explosive environment (such as near the vapor recovery system of a motor vehicle), an increase in temperature and/or pressure in the presence of a spark could ignite the entire system at which the smoke is to be used.

To overcome the risk of an explosion at the volatile, potentially explosive environment, the applicants have identified a non-combustible gas, namely nitrogen, to blow the flammable fluid against the heating element. It is pointed out that nitrogen gas is inert, contains no oxygen and, therefore, is non-combustible. One of ordinary skill would not be inclined to use a gas that will not burn to promote an ignition process to vaporize oil into smoke. Contrary to what would be expected by using a non-combustible gas, the applicants' use of nitrogen gas to blow the flammable fluid against the heating element permits smoke to be generated within a sealed chamber at higher pressures and temperatures and without the risk of an explosion.

This unexpected discovery of using non-combustible nitrogen gas to generate smoke is an essential feature of the applicants' improvement. To this end, as pointed out in the applicants' specification at page 13, line 17 to page 14, line 4:

As an alternative to pressurized air, carbon dioxide or nitrogen gas from a pressure and flow regulated tank or bottle can be used because of their non-flammable and inert characteristics. That is to say, smoke carried by nitrogen gas would be relatively safe for

testing the evaporative system of a motor vehicle which lies in a generally volatile environment of potentially explosive hydrocarbon vapors. Accordingly, the ability to produce smoke with nitrogen gas would provide a safe and efficient means for locating a leak in the evaporative system of a motor vehicle. Moreover, producing smoke with nitrogen gas rather than air would enable a variety of high pressure systems (e.g. an air pressure system) to be tested at high operating temperatures but without the inherent risks of an explosion.

What is more, the invention claimed by the applicants does not require that nitrogen be used as a trace gas or as a carrier for a trace gas. The nitrogen gas claimed by the applicants is specifically used for the purpose of blowing a flammable fluid towards a heating element that is located in a sealed chamber in a volatile, potentially explosive environment. In the patent to Brayman et al, there is a suggestion to use nitrogen as a carrier of a halogen gas to detect a leak in the relatively safe environment of automotive wheel rims. However, the invention claimed by the applicants in independent Claim 1, an now amended, makes no reference to the use of non-combustible nitrogen gas as a trace or a carrier, but only as an unexpected, safe means for blowing a flammable fluid against a heating element to promote ignition and thereby cause the fluid to burn.

Thus, despite the use of nitrogen as a carrier for a trace gas by Brayman et al, there is absolutely nothing shown or suggested in Pieroni et al, Gouge and Brayman et al, or any reasonable combination thereof, which would teach the improbable use of non-combustible nitrogen gas (i.e. a gas that does not burn) to blow a flammable fluid (e.g. oil) against a heating element to promote the vaporization of such fluid into smoke. There is simply no reason why one would think or be motivated to apply the nitrogen carrier of Brayman et al for use in a method to check the integrity of automotive wheel rims to the applicants' closed smoke producing chamber for blowing a flammable fluid against a heating element to cause an ignition by which to produce smoke for use at a volatile, potentially explosive environment so that dieseling within the closed chamber will be eliminated and the possibility of an explosion avoided.

Accordingly, independent Claim 1, as now amended, is believed to recite apparatus for generating smoke in a closed chamber for use at a volatile, potentially explosive environment which is distinguishable from all of the art which is currently of record herein. Inasmuch as independent Claim 1 is believed to be patentable, Claim 3, which depends therefrom, is likewise believed to be patentable.

As evidence of the patentability of the applicants' invention, a video tape has been presented to the Examiner to demonstrate the unexpected results of using non-combustible nitrogen gas to cause a flammable fluid to burn to generate smoke while eliminating a dieseling effect in a closed smoke producing chamber. As yet additional evidence of the patentability of

the applicants' invention, attached hereto is an article from the September, 2001 edition of "Motor" Magazine, wherein the "Top 20 Tools Awards" for 2001 are listed. Featured at Page 36 as one of the "Best of the Best" is the Leak Master Evap System Tester by Champion Engineering (the applicants' employer). Described therein is the applicants' claimed apparatus/method for administering a nitrogen-delivered diagnostic smoke test to detect evaporative emissions leaks. Thus, the applicant's' invention has been recognized by the trade as one of the best innovative new products for 2001.

Independent Claim 19 has also been amended to recite a method for generating smoke within a closed chamber for use at a volatile, potentially explosive environment including the steps of supplying non-combustible nitrogen gas under pressure to a closed smoke producing chamber for the purpose of blowing a flammable fluid against a heating element located within the closed chamber for vaporizing the flammable fluid into smoke, whereby dieseling within the closed chamber and the possibility of an explosion at the volatile, potentially explosive environment are prevented. For the same reasons as described above with respect to independent Claim 1, independent Claim 19, as now amended, is believed to recite a method that is distinguishable from all of the art which is currently of record herein. Inasmuch as independent Claim 19 is believed to be patentable, Claims 21-24, which depend therefrom, are likewise believed to be patentable.

Claim 22 is rejected under 35 U.S.C. 103 as being unpatentable over the aforementioned patent to Pieroni et al as modified by the aforementioned patents to Gouge and Brayman et al in

further view of the patent to Malcowsky et al. Despite this matrix of four patents which are proposed to be combined by the Examiner, it is pointed out that Claim 22 is dependent from independent Claim 19. Inasmuch as independent Claim 19, twice amended, is believed to be patentable, Claim 22, which depends therefrom, is likewise believed to be patentable.

Claim 23 is rejected under 35 U.S.C. 103 as being unpatentable over the aforementioned patents to Pieroni et al as modified by Gouge, Brayman et al and Malcowsky et al in further view of the patent to Seelback. Despite this even greater matrix of five patents which are proposed to be combined by the Examiner, it is pointed out that Claim 23 is dependent from independent Claim 19. Inasmuch as independent Claim 19, twice amended, is believed to be patentable, Claim 23, which depends therefrom, is likewise believed to be patentable.

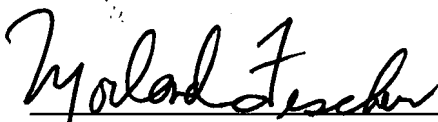
Claim 24 is rejected under 35 U.S.C. 103 as being unpatentable over the aforementioned patents to Pieroni et al as modified by Gouge and Brayman et al in further view of the patent to Ireland et al. Despite yet another matrix of four patents which is proposed to be combined by the Examiner, it is pointed out that Claim 24 is dependent from independent Claim 19. Inasmuch as independent Claim 19, twice amended, is believed to be patentable, Claim 24, which depends therefrom, is likewise believed to be patentable.

In view of the foregoing, each of Claims 1, 3, 19 and 21-24 which appear in this patent application is believed to be patentable. In this same regard, the applicants submit that the aforementioned amendments to independent Claims 1 and 19 place this pending application in

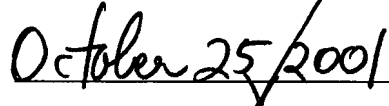
condition for allowance. However, the apparatus and method recited by the applicants have not been changed by virtue of this Amendment After Final Rejection. It is only the editorial content of independent Claims 1 and 19 that is affected so as to better define the scope of the applicants' invention and thereby more clearly recite the environment in which the applicants' invention has particular application. Thus, entry of this Amendment After Final Rejection is requested.

Accordingly, reconsideration of the Examiner's final rejection is requested and a Notice of Allowance is earnestly solicited.

Respectfully submitted,



Morland C. Fischer
Attorney for the Applicants
2030 Main Street, Suite 1050
Irvine, California 92614
Tel (949) 476-0600
Fax (949) 476-0606



Dated

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on 10/25/01

(Date of Deposit)



Date of Signature: 10/25/01

